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# Psychological Bulletin

EDITED BY

SAMUEL W. FERNBERGER, UNIV. OF PENNSYLVANIA

HOWARD C. WARREN, PRINCETON UNIVERSITY (*Review*)

JOHN B. WATSON, NEW YORK (*J. of Exp. Psych.*)

SHEPHERD I. FRANZ, GOVT. HOSP. FOR INSANE (*Monographs*)

MADISON BENTLEY, UNIVERSITY OF ILLINOIS (*Index*)

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# THE PSYCHOLOGICAL BULLETIN

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## EMOTION AS RELATED TO INSTINCT

BY HORACE BIDWELL ENGLISH

*Antioch College*

As a convenient starting point for this general review, we may take the publication of McDougall's *Introduction to Social Psychology* (39) which appeared in 1908. For while it may be true that the doctrine of instinct and emotion embodied in that book was implicit in James' *Principles*, it was McDougall's function to start a period of keen interest and discussion of the topic. What strikes one at once, however, in a survey of the fifteen-year period thus initiated is the meagerness not only of experimental but even of first hand empirical observation. Lloyd Morgan's moorhen, Spalding's chicks, and Fabre's and the Peckhams' wasps are forced to carry a pretty tremendous load for such diminutive creatures. The architectonic simplicity of McDougall's view made it admirably suited for practical application but did not so largely as its author might desire challenge investigation. Indeed it seems to the reviewer not unfair to say that the impulse to most of the observation and experiment in this field has come from other sources than McDougall. With one exception! It would be a great mistake to overlook the reflex accumulation of data which we owe to the attempts to apply this theory in education, ethics, economics, and political and social theory. These data are important; but with phenomena so complex, it is certain that no assured interpretation is possible without the support of experimentally controlled observations.

To ask the relation of Emotion to Instinct is to raise the question of the *function*, primarily the biological function, of emotion. Upon

this basis we may classify the various views of emotion which have been propounded.

- I. Emotion partially or wholly identical with instinct.
- II. Emotion as supplementary to instinct.
- III. Emotion as an instinct of a higher order.
- IV. Emotion as disintegration.
- V. Emotion as not instinctive at all.

All of the forms of the James-Lange theory may be classified under the first heading. If emotions are the organic resonance and if, as is almost always held, this is innately determined, then emotions are a special kind of instinct. The same reasoning applies if we think of the emotion as the fusion of proprioceptive sensations, innately aroused. Emotion may be a sort of vestigial instinct (one thinks of Darwin), or it may be regarded as a supplementary part of a larger instinctive complex, in which form this theory has obvious relations to the second type noted in the last paragraph.

Hans von Hattingberg (27) represents the first of these viewpoints. Emotions are vasomotor and visceral activities which must be regarded as *Urinstinkte* persisting alongside of the externally directed movements of the instincts proper. For Crile (14) also, the emotional response represents ancestral instinct. It is more strictly a rudimentary or truncated instinct, an incompleting response. It is a preparation for a response which does not come off and as such it is not particularly healthy.

The predominantly structural treatment and the complexity of Warren's views (69, 70) make it hard to classify them. There are innate neural connections between certain receptors and certain effectors, chiefly endosomatic. Fusion of the resulting systemic and motor sensations is the emotion, while the actual movements are the instinct. In the emotion, the feeling tone rather than the special quality of the constituent sensations is apt to be prominent. Substantially, then, the emotion is sensory, yet affective, awareness of the instinctive behavior. Some instincts seem not to be associated with a visceral resonance of any importance while other instincts seem capable of being intimately (and innately?) associated with more than one emotion.

For Binet (5), the emotional attitude is on a par with the intellectual and the voluntary. Attitudes are the mechanisms or processes as opposed to the contents of feeling and intellection. An attitude is related to movement as the image is related to sensation. Attitudes



may give rise to a backlash of kinesthetic or organic sensations by means of which we become aware of (*i.e.*, introspect?) them, but to realize these attitudes, the recall of these sensations is no more adequate than it is for the realization of movement. In emotion, of course, the backlash sensations are predominantly organic or visceral. But these, it is important to notice, are not the emotion but only the ways in which we know the emotion. Emotion is realized when a certain attitude is realized, becomes conscious when the attitude is perceived through its corporeal sensations. The relation to instinct is given only in a footnote. Instinct is movement, usually or at least often unconscious. We may become aware of it through kinesthesia, but also through the emotional attitude which, apparently invariably, accompanies it. We thus have external movement and accompanying kinesthesia constituting instinct in the narrower sense, associated with an organic attitude which has its own conscious representatives in the form of visceral sensations. The last two are respectively the emotion and the consciousness of the emotion. Theoretically at least, both instinct and emotion might be unconscious, that is to say, however, unintrospected.

For Dunlap (20) the emotions are the patterns of visceral reactions, perhaps with certain somatic reactions. These visceral reaction-patterns are unconditioned and are connected innately with the receptors for certain external stimulus-patterns. The sensory backlash gives us awareness of the emotion. To his own question, therefore, "Are there any instincts?" he seems to have given the answer, "Yes, the emotions." But Dunlap has another view of emotions in his doctrine of the desires (20, 21). Desires are processes in certain tissues. (They are not, be it noted, the awareness of these processes, though it would seem to the reviewer more conformable to common usage to call the physiological processes needs or some such term, and restrict the term desire to the awareness of such needs. And this is not inconsistent with Dunlap's systematic position, of which he is so notably careful.) These processes are both reaction-patterns and stimulus-patterns to further reactions. Apparently they are innately connected with certain stimulus-patterns, though this is not explicitly stated, but they can be detached from these objects and attached to others within certain rather elastic limits. Now allowing for differences in general psychological position and in terminology, the reviewer confesses his inability to see wherein this formulation differs in essentials from McDougall's, though Dunlap strenuously affirms a vital difference.

Along the line of the reviewer's suggestion in regard to the connotation of desire, Bertrand Russell (55), in an interesting article likely to be overlooked by psychologists, distinguishes between instinctive desires, which are conscious, and instinctive needs, which are generally and normally unconscious. "Our desires are mainly for things which primitive man did not get without difficulty. . . . But we have many needs which are not associated with desires, because under primitive conditions these needs were not always satisfied. . . . *Per contra*, there are desires which do not correspond to instinctive needs. . . . From the psychological point of view, the craving that they [drugs] satisfy depends upon the habit of taking them, not upon a preëxisting need."

Allport's ingenious extension of the James-Lange theory (1, 2), resembles the first of the statements ascribed to Dunlap. "Emotion is the way the body *feels*," is an unjustifiable repetition of James' original ambiguity but is to be interpreted as awareness of the bodily reaction. The emotion, so far as it is affection or affectivity associated with visceral behavior is regarded as a reflex. This reflex, while originally unconditioned, may also be conditioned through habit by new stimuli. The responses initiated by the craniosacral division of the autonomic system are pleasant, those by the sympathetic system are unpleasant. The differentiating factors in the various emotions are sensations arising from proprioceptors in muscles, tendons, and joints in the external parts of the soma. These somatic reflexes are genetically later, and less fundamental. It is not made clear how they are conditioned; apparently there is some innate basis.

All of these formulations, though chronologically subsequent to McDougall's "fertilizing" and ground-breaking statement, are logically independent of it and might have been fathered directly by James or Lange. Whatley Smith (59), though his view closely resembles some of the foregoing, represents a transition to the position taken by McDougall. Certain stimuli set up, by virtue of innate connections, endosomatic reactions, the awareness of which constitute the emotion. They also set up certain external movements, which constitute the instinctive behavior. We may, therefore, call the emotion the affective aspect of the instinct. And although there are terminological differences, this represents fairly well relevant parts of Calkins' doctrine of the emotions (8).

Although McDougall's statement of the relation between instinct and emotion is well known, it is not always quite understood. Briefly, the principle instincts, conceived as unconscious psycho-

physical structures or dispositions (to be strictly distinguished from instinctive behavior) give rise in their activity to complex behavior of which the *primary* emotions are the affective aspect.

Other lesser instincts display a more generalized emotional excitement without marked specific quality. A number of more or less complex emotional qualities are formed by blending these emotions in various proportions. These primary and blended emotions are thus experienced only as the result of the stimulation of instinctive dispositions.

The derived emotions, on the other hand, are of a distinct nature (42). They are really feelings, imaginative complications of the elementary pleasure-pain feelings, and only the fixity of terminology compels McDougall to list them with the emotions at all. Unlike the primary and blended emotions, they have no drive, embody no distinct impulse but are dependent upon the motive force of the desires (*sc.* the consciously represented goal of instinctive striving) which they qualify.

Quite different is the case with the primary emotions and their blends. Since both the cognitive and conative aspects of instinctive behavior are subject to modification in the course of experience, these emotions constitute the best clue as to which of our instinctive structures are furnishing the drive for any particular form of behavior. Although McDougall has modified his conception of instinct in at least one particular, and has added the description of the derived emotions, there seems to have been no essential change in his statement of the relation of emotion, that is of the primary emotions, to instinct. (Cf. 39, 40, 41, 42.)

As stated at the beginning of the review, this theory has been accepted almost whole by a large number of workers in allied fields. The list of references in Edie's *Practical Psychology for Business Executives* (22) gives some idea of the extent to which this conception has been adopted, especially as combined with certain near-freudian doctrines. (Cf. particularly, Parker, 48.) But a large number of British and American psychologists *von Fach* adopt it, at least in large part. The brief and somewhat vague introductory statement by F. L. Wells (71) in a recent book represents the nuclear opinion upon which psychologists, save a few radicals, agree. Instinct refers to need and the means for meeting it. The needs are basic, the means may alter. The impulse to act persists, the ways of acting change. Closely associated with the instincts as motive powers

are the emotions. The emotions may be considered according to the stimulating conditions or to the actions they stimulate.

As early as 1909 Kuhlman (35), without treating directly of the relation between instinct and emotion, had studied the varying types of instinctive response in the fear of young birds wholly in the spirit of McDougall's conception. Probably the most eminent psychologist to accede to the same view is the veteran Lloyd Morgan (46). For while he does not wholly agree with McDougall's conception of instinct, he holds that emotion is linked with instinctive activity from the first. Indeed it is emotion which gives color to the felt situation and from it is derived meaning. (This is also the position taken by Ewer, 24.) He adds, however, a word of caution about extending the conception uncritically to lower organisms, especially the birds. There are more instincts than there are special emotions. This view Read (53) also accepts and thinks to find confirmation for in the researches of Mott and Pagano, who found that emotion and instinct have the same anatomical seat in the basal ganglia. It is not clear in Titchener's *Text Book* (62) whether the "preëxisting determining tendency" from which the emotion issues is instinctive and innate or not; in the *Beginner's Psychology* (63) he states clearly that it may be wholly innate or partly acquired.

Perhaps the most striking evidence for McDougall's view is offered by Craig (12, 13), following along lines laid down by Whitman (76). For Craig definitely repudiates the idea attributed to him that his terms "appetite and aversion" are to be interpreted in any merely physiological sense. They are essentially of an emotional order, defined behavioristically and teleologically. Craig's observations seem fairly definitely to establish that these appetites and aversions direct and control instinctive behavior.

Other near-behaviorists have also accepted McDougall's position. De Laguna (77) would assign the emotions to the object. The emotional qualities of an object depend upon the system of responses that the object arouses in the organism. This system, though specific, is not invariable; the movements consist of an organization of alternative responses. The system is innate. "The emotional characteristics of a thing represent the immediate and direct functional value which the things possessing them bear to the animal and they control specific type-reactions directed to the thing thus qualified." It is not clear that Tolman's (64, 65) "determining adjustment" is an emotion; but it is without question that McDougall's emotions are determining



adjustments as Tolman defines them. And the same relation holds for Perry's behavioristic interpretation of purpose (50, 51).

Hunter (31) explicitly accepts a "central emotional core" for the instinct, and makes of this, with McDougall, the definition of instinct. For even prior to any activity of the instinctive tendency at all, experience may have modified both the perceptual and the affective aspect of the total instinct, which yet maintains its identity because of the persistence of the emotion.

Woodworth, also, who to judge from his recent paper before the American Psychological Association would not object to being called a quasi-behaviorist, agrees that emotion is part and parcel of the instinct. But he is inclined (72) to recognize a large number of purely individual native tendencies, each with a fairly definite emotional quality of its own. Indeed any sort of reaction, native or acquired, carries with it a sort of vague emotional coloring. The primary emotions are native (73) and are associated with specific instincts. There are not enough to go around, however, so that some instincts have no special emotion. Indeed the number of distinct emotions, if these are considered apart from the impulse which they embody, is very small. Apparently, however, we ought *not* to consider them apart from the impulses; so that the logical deduction would seem to be that we may have an indefinite number of emotions distinguished from each other by the impulses integrated with them. "The most important relation between instinct and emotion is what we have seen in the cases of anger and a few others, where the emotion represents bodily readiness for the instinctive action. The higher emotions are derived from the primary in the course of the individual's experience. English (23) in general agreement with Woodworth (72), holds that emotions can be detached and attached to habit complexes to such an extent that from a functional and existential viewpoint the latter are parallel to the instincts. Only genetically can they be distinguished but this genetic relationship is of importance in the control of the emotions.

As illustrating one of the few German statements directly pertinent to our topic which came to the reviewer's attention, Fröbes (25) quotes with approval Lehmann's (37) criticism of McDougall. Some of his instincts are questionable and his treatment obliges him to do scant justice to some of the emotions. Hence Fröbes believes that his classification endangers the facts.

A number of psychopathologists, notably Prince (52), have adopted and made large use of McDougall's doctrine—possibly the



best evidence we have of its actual value, though of course not in itself conclusive. Among the physiologists, Cannon (9) views his famous researches as confirming, or at least as consistent with McDougall's theory.

We turn now to the writers who treat of emotion as supplementary to instinct, as a sort of mobilization of the energy of the organism when the instinct is blocked. This theory also may obviously be combined with the James-Lange theory. It seems to be the theory consistently held by Dewey (15) in 1895 as well as in 1922 (16). In reviewing McDougall in 1908, Mead (43) makes specific reference to Dewey as the author of this theory (though it was a Stoic doctrine) and writes, "There is no emotion that belongs to an instinct, any more than there is a perception which belongs to its afferent phase. The emotion as such appears only when the activity has been inhibited and a conscious presentation of the whole situation arises." This would seem to account for only the unpleasant emotions but such is not Mead's position, for a little earlier he writes, "The peculiar nature of the emotion lies in the fact that it belongs to the whole state of consciousness, that it reflects into the process of stimulation and furnishes the value content of the object that arises in the situation, that it is related to ongoing activity, but it appears only when the activities have been checked." It would thus appear that the jokesmiths are right in saying that things only have value when we can't get them. One can see how value, with Lloyd Morgan (and implicitly with McDougall) attaches to all ongoing activity, and it is not wholly at variance with experience, it would appear, to identify this value with emotion. One can see, also, how emotion might be regarded as intensifying an already present value as with Drever (18,19). But it is difficult to see how emotion can furnish the value content to an ongoing activity and its object which are in themselves valueless, and can do this, moreover, only when the activity is checked.

The second of the positions just touched on is apparently that taken by Drever (18, 19). Our instinctive action has biological value, at least originally and in the main, which is represented in consciousness by a feeling of interest. Human instincts, being less fully pre-formed than those of the lower organisms, the individual must often work out for himself the lines of action which will carry him to the instinctively defined goal. Emotion acts to reinforce this action and intensifies the interest-value of the activity. The more instinct goes directly to its goal, the less the emotion. Complex in-

instinctive tendencies can never be simply and promptly satisfied and therefore are inherently emotional, while simpler instincts are emotional only when checked. Phylogenetically considered, the complex instincts were originally serial reflexes like the nesting of birds. As biological conditions became more complex with the emergence of more highly organized forms of life, the invariable sequence was less adaptive and was replaced by the emotional disturbance which secured that only those parts of the original sequence should be operative as suited the developing situation. Thus it is the emotion, as McDougall has said, which is the stable and important factor in all higher instinctive action. Balz and Pott tentatively adopt Drever's position in a book rich in methodological considerations (75).

A very similar position is taken by Colvin and Bagley (11). Each primitive instinct is accompanied by or consists in part of a certain affective state. When the normal instinctive expression is blocked, we get emotion. Any sort of inadequate expression is sufficient to give rise to emotion. Bogardus (6) takes the same ground but adds that emotion thus arises when habitual activities are checked. Münsterberg (47) likewise holds that the emotions represent a reinforcement and canalization of activities which need not always be innate.

Stratton (61) holds that there may be an angerless instinctive struggle. Anger reinforces instinctive struggle, elevating it to "a more clear expression of purpose." Parmelee (49) and Kempf (34) conceive of emotions as representing endosomatic pressures which instinct is not adequately relieving; the function of emotion is to reinforce the instinctive responses till an adequate environmental change does relieve the pressure. Of these authors, only Drever seems to have considered the difficulties raised for this theory by the "joy" emotions. Yoakum (74) cites his own emotional disturbance when a certain normal order of behavior was interfered with and compares his behavior with a cow's. This is taken to afford some slight evidence of Dewey's emergency theory. Carr (10), though he says nothing about whether the act is instinctive or not, clearly belongs in this same group, since he treats emotion as the processes by which the energy of the organism is mobilized.

All of the foregoing treat of emotion as useful. Dickinson (17) is inclined to take issue. The internal responses of the organism are largely unconditioned and these are, to be sure, usually useful. But these responses of the viscera are not emotions but only the objects of emotion. Following the formula of E. B. Holt, emotions

as subjective awareness can arise only when the internal response is itself the object which is focal and towards which the whole organism is integrated. This sort of thing would then be like introspection in the popular and morbid sense, would constitute an undue concern with the state of one's own "innards" and is therefore not to be encouraged. There is no question that this theory very neatly takes account of a certain kind of emotionality; but it seems to the reviewer to present difficulties when we come to consider such activity as a passionately angry attack. Here we may be reasonably sure that one's consciousness is integrated upon the opponent, not on one's viscera. (Is it not traditional that one may even not be conscious of receiving well placed blows?) Are we then to say that the anger is solely a matter of the observer's interpretation? The fighter afterwards will be able to state whether he was angry—and whether his testimony is reliable or not, it would seem to indicate that there is here a difference. If he declares that he was angry, are we to suppose that the anger is due to his now attending to his organic state? Or are we to deny that it is possible to fight vigorously and intensely and yet be angry?

Watson and Morgan (66) find three emotions which are instinctive and innate. These are to be objectively defined: there is "nothing in them which is not fully statable in terms of the situation and response." They are thus in themselves a sort of instinct and perhaps this paper should have been classified under the first main division of the review. But we find Watson, at least, (67, 68) adopting the shock theory of the emotions, so that we may fairly say that the emotions are accessory instincts to the others.

The reviewer finds it a little difficult to decide just what constitutes an emotion for the authors, despite the crispness of the stimulus-response definition. For we have, apparently, even in original nature, both plural response and plural situation for a single emotion. If fear is *fully* defined in terms of its stimulus and its response, then situation A leading to response A is, let us say, Fear. But a little later we learn that situation B leading to response B is also Fear. Nor are we to say that these two fears are merely sufficiently similar to be called by a single name; for we meet presently a transference of emotion. There are attachments and detachments. Fear is attached to new stimuli, new fear responses are conditioned. But by definition, when either the situation or the response is altered, let alone both, fear, which is fully statable in terms of situation and responses, loses its identity, and there are no grounds for using the same name.

Later, however, we learn that fear is a simple group of responses only (66, p. 169), and that the situation may vary considerably, leaving the identity of the emotion. The case with love (identified with sex in the wider freudian use of the term) is different. Here it is the stimulus which must remain constant (stimulation of the erogenous zones; we are not told how we can distinguish erogenous zones from others, but they are not merely the primary and secondary sex tissues of the physiologist) while "the response varies".

No wonder that McDougall's "mystical potencies", as some of his critics have called them, are preferred by the sociologist and the psychopathologist. For without troubling themselves with too much analysis in an alien field, they can accept these "potencies" as just what the man in the smoking room means by emotion. Whatever the defects of McDougall's definition, one knew what he was pointing at. The behaviorist definition has a most appealing clarity but it is next to impossible to discover what it is that is thus defined. The criticism is, of course, directed at a narrow interpretation of the stimulus-response formula, rather than at the exceedingly interesting observations found in this study. It may well be that the emotion of fear is more largely dependent upon the (chiefly overt) bodily response (compare Woodworth's contention that the impulse is the differentiating factor in various emotions) while the emotion of love is more largely dependent upon a certain type of stimulation. But one can scarcely repress the suspicion that after all fear and love and rage are here really conceived as the "central core" with variable situations and variable responses quite after the manner of the mentalists. And if this position were openly espoused, it would be possible to be more specific as to whether this emotion is inherited.

On the principle that opposites should meet, we shall next consider Shand's theory (57, 58) of emotion as a sort of Over-Instinct, an instinct of a higher order, comprising within its system a number of subordinate instincts. There have not been wanting critics to assert that the rather acrimonious controversy between Shand and McDougall (40) was entirely one of terminology; but a closer reading reveals genuine and probably important differences. Emotions for Shand are not primarily impulses or impulsive. The emotion expresses itself by stimulating one or more of the instincts which are organized within it, though the emotion may also be satisfied through activity which is too vaguely organized to be called instinct. The instincts by themselves are not emotional, though they may and perhaps generally do arouse one or more of the emotional systems to

activity. The treatment of instinct follows the older authorities in regarding it as a very rigidly determined sequence of movements.

Ginsberg (26), who understands Shand better than the reviewer, summarizes with approval his position as follows:

"1. An instinct may be excited without necessarily involving a specific emotion congenitally determined. . . .

"2. The same primary emotion may be connected with a plurality of instincts or rather of conative dispositions, *e.g.*, the emotion of fear may give rise to quite different types of behavior, *e.g.*, flight, concealment, shamming dead, silence, or immobility or loudest noise and violent efforts to escape.

"3. The same instinct may subserve the ends of different emotions, *e.g.*, the instinct of flight in birds is connected not only with the emotion of fear, but with others, *e.g.*, anger, joy of exercise."

Ginsberg also attributes to Shand the doctrine put forward by Drever. McDougall, he says, conceives of the emotion as a part, albeit the most important part of the instinct; Shand reverses this and conceives of the instinct as a part of the system of emotion. This system is originally innate in the case of the primary emotions.

With some hesitation the reviewer concludes that Stout (60) also concurs with Shand. He tells us, moreover, that he holds "tentatively that, given persistent conation and variable circumstances, *all* the changeable modes of emotional excitement are equally referable to general psychological laws as distinct from innate dispositions."

Hocking's treatment (28, 29) is in a measure intermediate between Shand and McDougall. With McDougall, he treats the emotions as the affective phase in instinctive acts. But some of our emotions, including some of those which are also parts of instincts, are generalized. As he points out, McDougall himself really treats of anger as a sort of general emotion since it is aroused in connection with the opposition or check to any particular instinct. These emotions of the second order, like the instincts, are regarded as specializations of an *elan vital* or "will to live" which may be found working in our innate constitution with varying degrees of particularity. Despite his philosophical objective, however, Hocking has a treatment of instinct and emotion of great value.

We may turn next to those who conceive of emotion as disruptive. Huey (30), following Janet, defines emotion as an interruption of adaptations for which some resources are present. The interruption consists of psycho-organic reactions of a disorderly character.



The expressions of the emotions as seen in clinical observation are anarchic and characterized only by the interruption to adaptation and by misfit functioning. Instinct becomes emotion only when malapropos. Here we have an example of the sort of interpretation of the normal from the abnormal of which the freudians have given us such an abundance. Kantor (33), objecting to the identification of emotion with affection, and insisting upon the essential transitoriness of instinctive or rather reflex behavior, cannot agree that emotion has thus much to do with instinct. Emotion is an interruptive response to suddenly presented stimulus (such, for example, as recurrent grief over the loss of one's only child after a long illness?) which sets in motion an organic resonance and thus facilitates a new response. Emotion serves suddenly to inhibit the former responses and thus make way for new ones. Instinctive responses or quasi-instinctive responses happen under emotion because the organism is at fault, because its integration has been broken down and the relatively primitive responses are alone possible. Bernard (4), in an article marked by an abundance of *a priori* "must be's," interprets emotion, as indeed all consciousness in terms of the breakdown of ongoing activities. He denies all sorts of instincts except those of the reflex type and does not associate the emotions specifically, of course, with these. Kuo (36) in similar fashion denies all instincts, even reflexes, and apparently denies also emotions.

We have already noticed a number of authors who modify McDougall's quite definite association of emotion with instinct. Reid (54) insists that there is an emotional character in every "complete psychosis" or rather that there may be. Any feeling in Ward's use of that term (roughness, hunger, fatigue, etc.) may become emotion if it is marked. The peculiar quality of the emotion is due to the entire nature of the complete psychosis. There are as many distinct kinds of emotion as there are possible experiences. For the rest, he seems to follow Drever in making interest the fundamental aspect of feeling (pleasantness and unpleasantness are but attributes of feeling, not themselves feelings), and in thinking that emotion develops when there is a check. But of course emotion has no particular relation to instinct as it has for Drever. Bolton (7) also finds emotion connected with any experience and has nothing to say about its genesis.

Seashore (56) thinks of "pure instinct" as a mere limiting concept. We should not speak of instincts in the plural for such instincts do not exist, but we may properly retain the term instinctive.

This seems very questionable policy. For instinctive as thus used is virtually a synonym for the hereditary, innate, congenital, con-nate, inborn, or inherited factor in man's nature and behavior. It is thus unnecessary; and on the other hand, it inevitably suggests to the reader the connotation of the "instincts" which Seashore condemns. In the case of mass reflexes (Are these not instincts?) "involving the whole organism, there results a mass consciousness of feeling of undifferentiated impressions, their meanings, their expressions, and their conflicts. This . . . is the common source of emotion and is often spoken of as the instinct feeling or the instinct impulse." But since instinct is a universal factor in all conscious life, it would appear that emotion is at least a possible factor in all psychoses and a differentiation functionally is not given. Structurally, the emotions are described in the usual terms but with much fuller emphasis upon recent glandular theory. (One is surprised to find Berman repeatedly quoted in a way to give the unwary student the impression that he is an acknowledged authority.) The chapter closes with a "biological classification of the emotions" adapted from Mercier (44). The "bio" might well be omitted from the description. The classification is a useful literary device, but its scientific value seems questionable. It is explicitly put forward to assist in fixing the connotation of the words used to designate the emotions. But such a fixation, until we know far more about the emotions than we do now, endangers progress. As Lord Bacon sayeth, "Whenever an understanding . . . of a more diligent observation would alter those lines to suit the true divisions of nature, words stand in the way and resist the change." For the present the more fluid and as it were purely denotative we keep the names of our emotions, the better. If this be a logical criticism, Seashore puts this classification forward as an exercise in classification and thereby invites purely logical criticism.

I have left to the last the only discussion which recognizes, though none too clearly, what the survey of the literature has borne in upon me, namely that there are emotions and emotions, and that it is still too early to hope for an inclusive formula. Languier des Bancelles (3) holds that McDougall's formula holds for some instincts and emotions, notably for the maternal, but not for others. It does not hold for joy and sorrow, which are true primary emotions but too general to be attached to specific instincts. And there is a third class of emotions, quite specific in character, which do not fit McDougall's schema. Typical of these are such important emotions as fear and

rage. These are to be thought of as the sequels of blocked instincts as suggested by Janet (32) and G. Montesano(45). Larguier des Bancelles does not contend that the theory of blocking explains all emotions, be it noted, nor indeed that it explains any of them fully. It does account for the specific characteristics of a large number. As against Janet and Huey, however, he holds that we cannot describe emotion as a disordered instinct. In the case of fear, for example, it is the phobias which are disordered instinct and these are clearly quite different from normal emotion. Emotions of this type, however, instead of being the counterpart of instinct, are its misfire. A continuous series can be constructed between practically emotionless and wholly adaptive instincts and the almost wholly inadaptive and even maladaptive emotion which results when the instinct entirely misses fire. Larguier des Bancelles does not attempt any sort of synthesis between the three forms of emotion which he distinguishes; the last type is his hobby and he sometimes speaks of such emotions as if they were the only ones.

No attempt has been made to survey the freudian literature; to do so would have been to extend unduly the limits of this review without adding much to its content. In a general way, the freudians would seem to adopt McDougall's formulation for those instincts and emotions which they distinguish. As is admitted, however, careful distinction of terms is a notable weakness of the entire movement. (On both points, see MacCurdy,38.) In the list of references, no attempt has been made to usurp the functions of the annual bibliographies of the *Index*. The writers quoted are frankly a selection.

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## CUTANEOUS AND KINESTHETIC SENSES

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The literature in this field for the last three years has been rich and varied. With regard to our fundamental concepts it has been, on the whole, critical rather than constructive. Some of the experimental results indicate that more than one important question has been envisaged in too simple terms. Goldscheider for some time, and more recently Head, have attacked the widely accepted view of cutaneous sensibility which assumes a one-to-one correspondence between sensory nervous elements and conscious elements. Recent studies seriously question the validity of Weber's Law in the realms of pressure and of temperature. Difference-thresholds determined by recent workers are large as compared with those of earlier investigations. One study indicates the likelihood of our having to revise our ideas about the location of certain of the cutaneous end-organs. An interest in the analysis and synthesis of various touch-blends may probably be regarded as a phase of the general interest in perception at the present time.

Head's book (24) is chiefly a re-publication of certain papers by himself and his collaborators, which have appeared from time to time in *Brain*. They are printed, with very few changes, as originally written; and Head has added an Introduction, an Epilogue, and an Appendix. For our present purposes the Appendix is most interesting. Here Head answers some of his critics: Trotter and Davies, v. Frey, and Boring. In each case Head points out rather extended agreement as far as observed fact is concerned. It is chiefly in the realm of interpretation that disagreement has occurred. In general Head holds that all of these investigators try to make a structural matter of what is really a problem in function. His own view accounts for some of the phenomena on which all these observers are agreed as being the result of interaction between two systems of nerves, whereas the other investigators explain these phenomena by assuming certain anatomical changes or conditions, the actual existence of which Head considers very unlikely. In this connection it might be pointed out that the existence of the two systems on which

his own explanations rest is itself an assumption. Carr's criticism<sup>1</sup> of Head's experiment is important here, but Head makes no mention of it. Hacker's experimental work<sup>2</sup> is not considered either. Pollock's work<sup>3</sup> is too recent to have been taken account of in this publication. The reviewer has no desire to depreciate the value of Head's work in this field, which he considers to be the most stimulating and in some respects the most significant in the history of cutaneous experimentation. He simply wishes to point out the difficulties that lie in the way of an easy acceptance of Head's interpretation.

Byrne (9) holds that each of Head's "protopathic" qualities is really a complex of hurtful (affective) and non-hurtful (critical) elements. In the interest of clinical study he makes a four-fold classification of cutaneous nerves as follows: superficial critical, superficial affective, deep critical, and deep affective. He considers this a good classification for summarizing sensory findings, but however useful it may be for clinical purposes, it is not likely to find favor with the psychologist; for one thing because of the ambiguity involved in the use of the term affective. Piéron, (37) holding fast to the traditional distinction between sensation and perception, criticizes Head on the ground that his interpretation fails to make this distinction. His objections have to do chiefly with the central processes postulated by Head.

Two studies have appeared on the DL for pressure, in both of which an effort was made to confine the application of the stimulus to as small an area as possible. Hansen (20) uses a mechanical device actuated by electromagnets. By this means a point covering 0.2 sq. mm. was applied to the skin with a known force. For stimulations of greater extensity two small metal plates, in area 20 sq. mm. and 88 sq. mm. respectively, were attached to the skin and the point was applied to these. Experiments were also carried out on a single pressure spot with a threshold of 1 g/mm., located in an area of 12 sq. cm. which was otherwise permanently insensitive to pressure. von Frey served as subject in this series. Under the conditions first outlined, the relative DL is found to be 43-21 per cent, lowering with increasing intensity of the stimulus. When the more extended areas are stimulated these values drop to 20-10 per cent. With the single isolated pressure spot the DL is highest of all. From his results the author draws the conclusion that Weber's Law,

<sup>1</sup> See this BULLETIN, 1917, 14, 96.

<sup>2</sup> See this BULLETIN, 1916, 13, 138.

<sup>3</sup> See this BULLETIN, 1921, 18, 187f.

in so far as it holds at all for pressure sensation, is conditioned by extensive changes of the stimulus and not by intensive ones. The other study, reported by Kiesow (27), was carried out by one of his pupils; and its purpose, as the title indicates, was to determine the DL of single sense-organs of pressure. Calibrated hairs and the method of Minimal Changes were used. For medium intensities of 3-6 g/mm. the relative DL is found to be constant at about 14 per cent, considerably lower than that found by Hansen. These results, also, except at the extremes of the intensities used, conform closely to Weber's Law, as Hansen's results do not. The divergence in results may be due to the fact that Kiesow's pupil worked on his own wrist and used no other subjects. His reasons for doing this do not seem to outweigh the disadvantage which may arise from suggestion in spite of all precautions.

Hausmann (22) argues for the existence of a deep-lying pressure sense. He also holds that the skin itself is capable of mediating a touch sensation when it is stimulated without deformation, and a pressure sensation when deformation occurs. His contribution is mainly critical. Gault (18) reports on his study of the case of a blind girl who claimed to be able to interpret speech through vibrations conducted to the palm of her hand or to her finger-tips. Tests showed that she was able to do this, and led to experiments along the same lines with graduate students having normal eyesight. The success of the last named group seems to indicate that the blind girl's ability was due to practice and was not dependent, as the title of the article suggests, upon an unusual degree of tactual sensitivity. Allers and Halpern (2) find that warming the skin lowers the threshold for pressure, the minimum being reached at some 36-38° C. They go on to make a detailed study of the effect of different skin conditions upon the threshold. In this connection the work of Berger (5) is of some interest. He shows that the skin temperature may be raised, both in hypnotized and in unhypnotized subjects, by mental processes. Benedict, Fox, and Baker (4) determine the surface temperature of four large pachyderms, and raise an interesting question as to the effect of environment upon skin temperature in man.

Of recent studies of the temperature senses probably the most significant is that of Pütter (39). Metal plates, held at desired temperatures by water circulating beneath them, are used to determine the DL's for the palm of the hand and the ball of the thumb. The finest discrimination is found in a region close about 28° C.,

the DL here being  $0.5^{\circ}$ . With lower or higher temperature the DL rapidly increases. Even the lowest threshold values found in this experiment are considerably higher than those found by earlier investigators. As for Weber's Law, the author finds that his results do not conform to it at all, either for warmth or for cold. Instead, they follow another principle, which he has already formulated, to the effect that the DL is an exponential function of the intensity of the stimulus. The author reaches other interesting conclusions, one of which is that some organs sensitive to thermal stimulation must lie at a distance of only 0.1-0.15 mm. below the surface of the skin. This conclusion is based upon a study of the smallest length of time the hand must be stimulated in order that accurate judgments may result, combined with a calculation on physical and physiological grounds of the rate of conduction of heat through the skin. He points out that no nervous structure is known in the human skin which lies as superficially as this, though free nerve endings have been found in animals. He holds it possible that fibers of this sort may exist in man, too, and respond to temperature stimulation, but he points out that this conclusion does not deny that some of the deeper-lying structures may also act as end-organs of the temperature senses. Baron and Bentley (3) make a study of the supposed summation of temperature sensations. They point out a number of conditions which may result in apparent summation without any real summation having occurred. The condition selected for special study is that of the "tuning" of cold spots. They find that spots differently tuned give sensations of unequal intensity when aroused by the same stimulus. If a spot of lower tuning were stimulated, first singly and then along with a spot of higher tuning, the result might readily be interpreted as summation. Their experiment shows that the simultaneous stimulation of two or more cold spots does not give rise to a more intense sensation than that which would be given by stimulation of the highest tuned spot. They conclude that there is no true summation.

The effect of arousing simultaneously more than one cutaneous sense quality has been variously investigated. Tung (42) stimulates a cold spot and a pressure spot. Under appropriate conditions the resulting experience is one of wetness. The subjects reported this experience in about 80 per cent of the trials. Malmud (31) makes a similar study of warmth and pressure. Here wetness does not appear in the reports of the subjects, and when fusion of the two qualities occurs it is characterized simply as "warm pressure" or



"pressure-warmth." Knight (28) adds an investigation of the integration of warmth and pain. Here the experience is designated as "burning-hot," or as "burn," or "hotness." The author also finds some support for the view that warmth lies in a qualitative pressure-pain continuum. Cobbey and Sullivan (10) analyze oiliness into a fusion of warmth and light pressure. They find it possible to produce the perception of oiliness in 63 per cent of the trials by stimulating a hair with a heated temperature cylinder, the touching of the hair producing pressure and the radiant heat of the cylinder arousing warmth. This work was done in ignorance of Malmud's study mentioned above. To clear up the difficulty arising from the difference in results between these two studies, Bershansky (6) repeats the experiments of Cobbey and Sullivan. She finds that the warmth-pressure integration is more apt to suggest oiliness to the subjects than any other objective quality, but this quality does not necessarily have to occur to them at all. Stickiness is found by Zigler (46) to depend essentially upon the complex of pressure sensations aroused by the breaking away from the skin of the sticky stimulus. Deep pressure may be involved as well, but is not a necessary component. The same author (45) finds that clamminess has two components, one sensory and the other imaginal. The sensory one is analyzed into cold and a complex of different pressures; the imaginal one is unpleasantness. Meenes and Zigler (33) find that movement is necessary to the perception of both smoothness and roughness. In the case of the former, cutaneous pressure is involved; in that of the latter, both cutaneous and subcutaneous pressures. In smoothness there is uniform clearness and intensity; in roughness rapid changes of both. Sullivan (40) finds both liquidity and semi-liquidity—percepts which may be aroused by solid objects—dependent upon a fusion of pressure and temperature. Solidity, however, depends upon a pattern of pressure alone. Bershansky, (7) starting from an observation of Thunberg's, studies the illusory wetness that follows the removal of a cold pressure stimulus applied for some time to the skin. It is found to be a fusion of after-sensations of pressure and cold.

The recent literature is fairly rich in studies of pain. Goldscheider's book (19) is the most extended contribution. It is essentially a résumé of his views and the evidence on which they are based. The central point of his thesis is the contention that pain is not the result of stimulating specific nerves, but is rather due to an overstimulation of nerves which ordinarily mediate sensations sim-

ilar to touch or pressure. He believes it quite possible that the same fiber might mediate one quality under one set of conditions and a different quality under other conditions. Opposed to this view is the more widely accepted one of v. Frey, who believes that certain fibers when stimulated mediate the specific quality of pain, and that alone. In a recent article (16) he describes methods by which he has succeeded in arousing pain sensations without simultaneous arousal of any other quality, by means of each of four different kinds of stimuli: mechanical, thermal, chemical, and electrical. Lebermann, (30) one of v. Frey's pupils, continues one branch of this study with an investigation of the arousal of pain sensations by means of chemical stimuli—tiny drops of acetic and formic acid in solutions of varying strength. In collaboration with another of his pupils, Webels, v. Frey (17) recurs to the question of the sensitivity of the cornea and the sclerotic. The authors point out defects in technique of earlier investigators. Using several forms of stimulation and working under different conditions, one of which involved cocainizing the surface of the eye, they were able to elicit only two of the usual four cutaneous qualities—pain and cold. In another article (15) v. Frey reports a study of the latency of pain sensations and of the second pain sensation which often appears, some time after the first, without repetition of the stimulation. The latency, when it occurs, is accounted for by the time consumed by a metabolic process which is started by the stimulus and which in turn arouses the pain fiber. When the pain sensation develops without latency, the stimulus has affected a fiber directly. When two successive sensations develop from a single stimulation, one fiber has been directly aroused by the stimulus and another indirectly through the metabolic process. All of these studies yield results which have a direct bearing upon questions at issue between v. Frey and Goldscheider, especially the question of specific pain nerves.

The sensitivity to pain stimuli of the oral cavity is studied by Marx (32). Kiesow's results for the inside of the cheek are confirmed. The author also finds areas of analgesia or hypoalgesia on the uvula and soft palate, and even, in some cases, on the tonsils and hard palate. Möhrke (35) starts with the problem of getting an exact measure of the intensity of pain sensation, and hopes to find it in the effect of the application of pain stimuli upon efficiency in such mental activities as arithmetic, reading of syllables, etc. His results are negative, and he accordingly makes a study of adaptation to the forms of painful electrical stimulus used. The adaptation is

found to take from seven to eleven minutes. In this connection mention should be made of another study of the effects of stimulating the skin electrically. Ebbecke (12) brings out the physiological difference between direct stimulation by the current of the nerve endings and branches, and their indirect stimulation when the current has its immediate effect upon the skin. Kauffmann (26) advocates the clinical use of the latent time of pain sensations as an index of the sensitivity of a skin area. He presents the results of experiments to show that with a stimulus of given intensity the more sensitive the area the shorter the latent time. Mittelman (34) finds that the application of a stimulus to certain spots will arouse, not only a sensation localized at the point of application, but in addition a pain sensation located somewhere else, often a considerable distance away. The primary sensation need not be one of pain, for sometimes stimulation of a cold spot will give the accompanying pain sensation. Of nine subjects examined the phenomenon was found in eight. The articles by Head, (23) Harris, (21) Thorburn, (41) and Hoche (25) deal chiefly with clinical and anatomical matters which are only indirectly interesting to the student of cutaneous sensation.

Two new pieces of apparatus for cutaneous work are described by Dallenbach (11). The kinohapt is a modification of Benussi's apparatus for applying mechanical stimuli to the skin in spatial and temporal patterns. The thermal stimulator is an improved form of thermesthesiometer which carries a pressure-scale and has a point designed to bring to the skin a temperature more nearly equal to that of the cone than has been possible with other arrangements.

One of the most interesting studies of the kinesthetic sense which has appeared in recent years is that of Allers and Borak (1). Their investigation is made with individuals who have been operated by Sauerbruch's method. With such individuals the sensations aroused by the activities in question can come only from the muscle itself or from the structures immediately attached to it, since the joint and the more distant tendinous attachments do not exist. The operated subjects are found to have thresholds for movement and sensitivity to weight differences as fine as those of normal subjects. The authors conclude that the sensations which form the basis for the perception of weight and of extent of movement must be chiefly of muscular origin. Borak (8) reports elsewhere on a study of weight discrimination with normal subjects. He points out that while a pair of scales reacts in equal degree to the addition and subtraction

of a given increment of weight, the human being may react differently to an increase than he does to a decrease. To test this he makes a careful study of weight discrimination to determine whether the subject's sensitivity to the difference between two weights is to any degree dependent upon the order in which they are presented. The results show that for the three different weights used and for all subjects the number of right judgments is 30 per cent greater when the lighter weight is lifted first than is the case when the heavier weight is lifted first. Increase in tension, he suggests, must be a more powerful stimulus to the nerve-endings than decrease in tension.

Fernberger (13) makes a study of the stimulus error in the case of discrimination of lifted weights. The subjects were given three sets of instructions in three separate series. In one they were to report only on the intensity of pressure sensations on the tips of the fingers, in the second they were to judge the intensity of kinesthetic sensations localized in the wrist, while in the third they were to judge the weights themselves. All three series give reliable results, but the curves vary for different series for the same subject. These differences are interpreted in the light of earlier results relating to the criteria on which the subject makes judgments at different stages of practice. At first the criterion is largely pressure sensations on the finger-tips, but gradually these are lost until there is a complete shift to kinesthetic criteria. As for judgment in which the stimulus attitude is assumed, it is "distinctly a complex perceptual process on the 'meaning' level." The author closes by pointing out that his experiment "seems to show the futility of properly interpreting the statistical results of a purely behavioristic study without the control of introspective report." The discussion of this point by Weiss (43) and Fernberger's reply (14) bring out clearly the attitudes of the behaviorist and introspectionist respectively toward the study of weight discrimination. In this case the behaviorist comes empty-handed as far as data are concerned.

Pear (36) advocates systematic study of kinesthesia on the ground that in the teaching of skilled forms of activity we are handicapped by lack of terms in which to designate bodily attitudes and movement. Laird (29) contributes a note on the nature of subcutaneous sensations which were aroused by stimulating directly the muscles in the stumps of fingers which had been cut through, either wholly or partly, in an accident. He reports these sensations to be different both in intensity and in quality from those aroused at the

same time by pressing down upon the anesthetized skin of the forearm. The directly aroused muscle sensations are somewhat more intense, and also more brisk and compact than the others.

Pirig (38) contends that the perception of motion cannot be understood without an understanding of the perception of position. She undertakes, therefore, to determine the DL for sensations of position of the arm and the eye, and to investigate the relationships that exist between the perception of position and the perception of movement. The DL for position of the arm is determined with the aid of the Störing kinematometer and is found to be  $0.635^\circ$ . The DL for the eye is determined by means of an arrangement whereby the subject fixated points of light in different positions in a dark room. These conditions were, the author thinks, as analogous as possible to those for the arm. The DL obtained for the eye is  $0.27^\circ$ . The sensation of position is found to be independent of movement sensations. The perception of movement, however, is found to be (a) a complex of continually changing sensations of pressure, tension, etc., and (b) the perception of the part of the body in space. The investigation as a whole is very diffuse, and it loses much in force for lack of an adequate statistical treatment of results.

Before closing this account mention should be made of a study of the so-called vibration sensation. Wood (44) further standardizes the method of arousing this sensation with a view to its use in diagnosis of clinical cases. He gives tentative norms, and graphs of results obtained from cases of nervous disease of different sorts, which show marked and significant deviations from the norm.

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## THE DREAM LITERATURE<sup>1</sup>

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The purposes of this review are to present a bibliography of the more important papers written on the general subject of dreams and to give a review of the literature since the last review in the *BULLETIN* by Miss Small in 1920 (85). These references, together with those included in the previous reviews in the *BULLETIN* (29, 30, 85) and some of the books with good bibliographies (9, 19, 24, 25, 45, 65), give a fairly complete bibliography of the dream literature.

Unfortunately not a few of the papers printed since the last review were not available to the writer so that the following statements cover only about 70 per cent of the recent literature.

No recent literature with the exception of Kimmins' book (55) gives any statistical material. Previous statistical articles are Bentley (3), Calkins (6), Heerwagon (36), and Wiggam (94). Kimmins' book, according to a review, gives the results of a study of the dreams of 1,000 London school children. In general these early studies reached the same conclusions, but none of them are the critical studies which are badly needed at the present time. This is a good research field and should be studied both by a broad questionnaire (keeping the limitations of this method in mind) and by personal collection. Apparently the Cartesian Research Bureau has been making such a collection, but they have published very little of the material. (See Horton, 37-45.)

There seems to be more non-Freudian papers published in the last three years than Freudian. Much material of this nature is published in the *International Yearbook for Psychoanalysis*, (48) which was not available to the present writer. That extreme Freudian interpretation is still rampant is shown by Turner's paper (88). A child dreams of a spider at the age of five which is interpreted in terms of much sex content. When we see college juniors and seniors learning, for the first time, that certain things are phallic symbols, we wonder that a young child should have all this information at

<sup>1</sup> This material was gathered from a paper presented to the Psychological Seminar, January 8, 1924.

hand so early for the use of the dream mechanism. The contribution of a woman (95) summarizes the content of 5,000 dreams. She finds that her extensive botanical knowledge appears in her dreams. In her dreams the sex content is symbolically given in the plants seen, such as plants that have stamens or pistils only and others that are sexless. Her dreams were spontaneous and resisted any attempt to predict them or to influence them before going to sleep.

Gregory (31) presents evidence to show the commonness of dreams of "frustrated effort." He gives many references to this type of dream but no actual dreams. He concludes that the cause for this kind of dream is tactual sensations and possibly bodily position. Moxon (67) finds evidence to indicate that mystics are a subclass of hysterics and that his four stages of the dream show in the stages of mystical ecstasy. These stages are phantasy, will not to know the world, through the darkness to the light, and exhaustion. Nichol (69) indicates the universality of the rebirth theme in dreams. Several actual dreams are quoted to prove his thesis.

Sturt (82) shows that the dreams of a normal person may be interpreted without the aid of a sexual theory. The dreams given show a jealousy motive with regard to girl friendship, the problems appearing in literary settings. These dreams disappeared as the problem became solved.

Visual imagery, as well as other sense modalities, were found in the dream content of a blind subject by Wheeler (93). Four dreams are presented in detail. The subject's dreams followed the same synaesthetic reference system as did his imagery when he was awake. Three facts are emphasized by the writer, first the appearance of association between visual and other sense modalities. Voices and directions are recognized by color. Secondly, the subject tended to vocalize the spoken words of another person's voice in terms of his own vocal-motor imagery. Differentiation was possible by different colors. The third item is a "visual me" which appears in most of his dreams. This is probably due to a consciousness of being watched.

The behavioristic position is strengthened by Taft's report (86). Taft's wife desired that Taft speak to an alcoholic neighbor and indicate to the neighbor that his weaknesses were not liked by other people living in that district. Taft kept putting the matter off until one night he dreamed he was going to do this. In his dream he saw the neighbor and had his speech prepared, but he was unable to say a word. After a brief, awkward pause Taft awoke and found his

mouth and throat dry and hard, due to a cold he had taken from exposure. He concludes his inability to talk was due to the hardness of his mouth and throat preventing the necessary motor sets. More evidence of this type would aid in understanding the part played by motor sets and incipient imagery in our behavior. A collection of dreams while going under and coming out of a general anaesthetic would give valuable information along this line and make a good behavioristic contribution.

The endocrine field is another rich source of information which is just beginning to appear in the literature. The causal effect of certain endocrine products is demonstrated by Finley (21). Finley's patient had good health but a great lassitude which interfered with her work. Her work required considerable energy. The treatment, which had largely to build up her blood pressure, was to give one grain of extract of whole pituitary per day. After having received ten grains of the pituitary the patient began to have very pleasurable, highly colored dreams. The patient's previous dreams were uncolored. She dreamt that she traveled a great deal. The railroad stations and equipment were freshly painted in pleasing colors in contrast to the actual facts. The trainmen all wore new and well cared for uniforms with gold braid decorations. After a short time the patient developed a slight hand tremor and thumb abduction, so the pituitary was discontinued. Then adrenalin was given. Her dreams immediately changed and became horrible and rigid. She had violent and terrible quarrels. The dreams lost all their color. This treatment brought on an intermenstrual period between her regular periods, and during this interperiod the pleasant, highly colored dreams reappeared. Then the treatment was discontinued and the patient's dreams became trivial and uncolored, as they were before the treatment. The pituitary seemed to bring out some of her unfulfilled desires, while the adrenalin stimulated her fear mechanism. She had no effects from the autocoids during the day. Finley concludes that this shows a pure physiological control of these emotions and that these results show a part of the mechanism.

With reference to the physiology of sleep, most writers indicate that the chapter in Howell's textbook (46) is one of the most complete discussions available.

The account of Delage (12) presents a kaleidoscopic theory of dreams and is too popular to be of much scientific value. The article of Boulden (4) urges dream study as an aid in understanding the psychoses. His conclusions are as follows: Dreams occur when



some areas of the cortex are awake and others are asleep. Some areas are more vulnerable than other areas, the susceptibility varying, (a) in sleep with the kind of fatigue, (b) in psychoses with nature of the toxins and deleterious agents. Observation of dream phenomena may help to correlate the clinical manifestations of the various psychoses. Various psychoses exhibit parallel but more extended processes. The ratio between functional and nonfunctional areas in dreams is inverted in the psychoses; hence in the latter contact with the environment is greater. The remainder of his conclusions pertain to the psychoses and not to dream content.

Sidis (77) advises more biological and mechanical study of symbols. Also he advises further that more simple and natural ideas be used rather than the sex idea. He gives the results of treating a patient by hypnosis. The patient's dreams changed from fear dreams to simple dreams of everyday reference. The two following quotations seem to best summarize his views on dreams: "*The organized dream systems recurred in an automatic way as reflex reactions in response to the same or similar conditions of external and internal stimulation in the same way as the conditioned reflexes in Pavlov's dogs*" (p. 139; italics his). "Dreams are found by me to be automatic, nonadaptive, mental systems recurring under various forms as highly complex conditional reflexes lacking adjustment to the present world of external and internal reality" (p. 141).

In connection with this and some of the following papers the writer would like to indicate that Dercum's early paper (14) has not received the attention it merits. This paper was written when the interpretation of all dreams in sex symbols was in its infancy. Dercum gives a good description of the Freudian method and criticizes certain features of it. He indicated that its greatest value is in the case of the hysteric and neurotic patients and it is not for universal and uncritical use. He presents one case where the sex material was given because the analyst expected it. He concludes by summarizing the advantages and limitations of the Freudian method.

Dunlap (17) makes a plea for more normal associations in dream interpretation as well as for experimental and physiological data.

Rivers (76) criticizes the Freudian method by pointing out the importance of the following conditions: First, the time of the analysis, whether it is immediate or several days later. Second, whether the analysis is made by the dreamer or another interested person. Third, whether the events are recorded immediately or brought out in the analysis. The fourth point is whether the associations are

open or start from the actual content itself. Fifth, the special process of association used. Sixth, how much the analyzer (unconsciously) brings the results as he wishes. He indicates that the data are of no scientific use unless the above conditions are understood and controlled. Rivers points out that diagnosis is one thing and the scientific method is quite another thing. Unless the data for a scientific study are gathered from properly controlled situations they are worthless.

While discussing his own dreams he remarks that many of the ideas for research come during the stage of waking that is half awake and half asleep. It is a bit of mental hygiene that is worth noting. Rivers puts his own dreams down immediately and refrains from attempting to analyze them while he is writing them down. If he later thinks of some more of the dream he indicates that it is a later addition. He then makes his analysis of the dreams before breakfast. When analyzing dreams of his patients he attempts to make it a partnership affair and in that way avoid adding material by suggestion.

Rivers criticizes the free association method in that it may add much material not related to the dream. Also in the Freudian method of getting associations they work with the patient in a hypnoidal state. It is difficult to prevent this in any other than a partnership arrangement. The extension of the method and data from hysteria to all states of mind is condemned. Rivers' final plea is for some real controlled scientific studies of dreams that are made for that purpose and not for diagnosis.

To aid in understanding Horton's last paper it is necessary to refer to an earlier paper. The dream material is recorded in a four-page booklet (37). The pages are arranged so that only the actual description is placed on one page, another page has additional description that would have been added to the first under usual methods as an afterthought. Material gathered during the analysis is put on another page and the analysis on the last page. Everything in the dream is listed in a decimal classification not greatly dissimilar to the familiar Dewey system. The interpretations are made from these data with the aid of certain principles. In passing the writer wishes to call attention to several other papers of Horton that are reviewed elsewhere. They are the papers on the levitation dreams and indicate to a large extent some of the physiological factors which cause dreams. He had more success in causing dreams than any other writer on the subject, as well as some of the best controlled situations.

Horton's recent paper (43) compared his mechanistic "trial and error" reconstitutive method to the reductive method of Freud and the constructive method of Jung. Horton finds symbols to be too variable to permit a modification of Freud's method to be of service. He states "the dreamer is very much in the position of someone trying to get at a memory that is just below the threshold of conscious recollection. . . ." His statements lead one to wonder if there is any relation between the censor and the threshold. The dream can be explained through the mechanism of stimulus setting in action certain neurograms which give the end result. On account of the time lag in the neurograms getting into action the energy may flow into other neurograms which are more irritable. This seems to the reviewer to be much the same as proprioceptive back kick or proprioceptive secondary reflex arc of other writers. Symbolism is the result of known stimuli plus facilitation. The mechanism of time inversion is due to a part of the reaction getting in ahead of the rest by facilitation. This is illustrated by a typographical error, also by Carolism's (frumius = furious + fuming) and vernierisms, *e.g.*, any vernier scale. Another doctrine that Horton used is that of unit concordance, which is the very full and well cross-indexed association system of the individual. He finds that these principles with the dream material so listed and classified permit of an accurate analysis which can be checked by "retrospective prophecy." His papers are somewhat abstract and full of material which does not lend itself to a relatively short review.

The writer regrets that more of the material was not available, especially some of the books. Certain papers published previous to the period reviewed have been included where it seemed advisable. In concluding we see that most of the material of the past is not of use in a scientific study of dreams. The practitioner can give us much more data, especially as he realizes the difficulties and more nearly approaches the controlled situation. Innumerable problems present themselves to the scientific, psychological, and medical research student. Some of the larger of these have been indicated at the appropriate places.

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## SPECIAL REVIEWS

WADA, TOKUJIRO. *Anatomical and Physiological Studies on the Growth of the Inner Ear of the Albino Rat. The American Anatomical Memoirs*. Philadelphia: Wistar, 1923, No. 10. Pp. 174.

Wada has made the most intensive correlation of structure and function in the inner ear of the rat which we have. The study, carried out at the Wistar Institute, is directed at the detailed, quantitative analysis of the cochlea, the spiral ganglion, and the vestibular ganglion partly with a desire for the anatomical results and partly with the intention of determining what changes occur correlated with the onset of hearing.

Forty male and thirty female animals, representing every phase of postnatal growth and having approximately standard body weights, were used. The method of vital fixation was employed. Four ears in each of fourteen age groups were studied in connection with the cochlea and with the vestibular ganglion. Detailed measurements, of which the following are samples, were made and the results presented in tabular and graphic form: (a) the radial distance between the habenula perforata and the inner corner of the inner pillar cell at base; (b) the greatest height of the greater epithelial ridge; vertical distance from the membrana basilaris to the summit of the pillar cells; inner and outer hair cells; etc.

It is impossible to summarize the data. The curves show that the period of rapid growth in the features measured was completed in from twelve to twenty days. Two waves of growth were found, one extending from the base to the apex of the cochlea and one from the axis to the periphery. In comparing the measurements of the various constituents of the cochlea for a hearing and a nonhearing rat of the same ages, the following points are made: (1) The tectorial membrane is longer and of a different appearance in the hearing rat. Fine hairs do not connect it with the spiral papilla. (2) The basilar membrane as a whole shows a slight increase in breadth in the hearing rat. (3) The tunnel of Corti is always present in hearing rats. (4) The Deiters' cells and Hensen's cells are larger in the hearing rat with a consequent increase in height of

the spiral papilla. And (5) in the hair cells and the cells of the spiral ganglion there is little difference between the hearing and the nonhearing rat.

The following quotation (p. 154) is significant: "Thus the inception of hearing does not coincide with the detachment of the tectorial membrane from the papilla spiralis, but with the development of each constituent of the papilla spiralis and the membrane tectoria, as has been described. As these changes occur first at the base and then pass to the apex, the animal can perceive at first only the sounds of high pitch. One or two days later development is complete in all the turns, and then the rat can hear the sounds of lower pitch also. Thus the process of the development of the cochlea does not support the "telephone theory" of audition, but on the contrary agrees with the conclusion that the papilla in different locations in the turns of the cochlea responds to sounds of a definite pitch, . . ."

Tests for hearing were made by a nontraining method. The rat was separated from the source of sound by a plate of glass. Observation was directed toward the occurrence of eye- and ear-reflexes following upon auditory stimulation. The stimuli employed were handclaps, a low sound made by drawing in the breath through nearly closed lips, and a whistle of about  $c^4$  pitch. The hearing reflex was never secured before nine days of age. It seems to appear earlier in vigorous and well-nourished animals.

With reference to the work on the cells of the spiral ganglion and those of the vestibular ganglion, the following summary by the author may be given:

"The largest cells in the ganglion spirale are very immature at birth, reach their maximum at twenty days, and after that diminish in size, slightly but steadily. The rat hears, therefore, before these cells have reached their full size.

"The largest cells in the vestibular ganglion are precocious and remarkably developed, even at birth. They cease their rapid growth at about fifteen days of age, but increase very slightly though steadily throughout life."

The reviewer finds nothing in the study which would explain the results indicating tonal deafness found by Hunter in 1914, 1915, and 1918.

WALTER S. HUNTER

THE UNIVERSITY OF KANSAS

GREENMAN, M. J., and DUHRING, F. LOUISE. *Breeding and Care of the Albino Rat for Research Purposes*. Philadelphia: Wistar Institute, 1923. Pp. 109.

This volume should be in the hands of every student who uses the rat for experimental purposes. It contains a clear and concise summary of the experience at the Wistar Institute in the care and handling of the rat. The material is grouped under the following headings: colony building and equipment; cages; food and feeding; behavior; breeding; parasites; diseases; standards, reference tables; and transportation of living rats. The volume is well supplied with illustrations and with directions for the establishment of standard conditions in the animal colony.

WALTER S. HUNTER

THE UNIVERSITY OF KANSAS

PYLE, WILLIAM H. *A Laboratory Manual in the Psychology of Learning*. Baltimore: Warwick & York, 1923. Pp. 161.

The author starts with a brief chapter on the nature and aims of experimentation and follows this with an elementary discussion of the treatment of data. For each of the experiments that follow the author states in laboratory form the object, material, sample results and their interpretation and discussion. The experiments have to do with motor learning (ball tossing, mirror writing, and card sorting) and also a new experiment which uses as material the sorting of marbles of different size and color. Another variation of this experiment which involves the choice of marbles of different sorts with the two hands simultaneously gives a chance to study a very complicated example of motor learning.

The substitution experiment and related experiments deal with what the author calls semi-motor learning. Card sorting is then introduced to test the retention of motor learning. Then a rearrangement of the bins for card sorting gives the basis for the study of inhibition.

Under learning of a mental sort, Pyle first introduces experiments with the tachistoscope—such as the spot pattern and range of attention—to test the quickness of perception. An experiment in which stanzas of poetry are shown for only one exposure of three seconds gives the opportunity for studying immediate verbatim learning. In a chapter on Serial Learning is introduced experiments with nonsense syllables and meaningful words. Under Associative Learning

is studied simple paired associates. Verbatim learning of poetry is made with both visual and auditory presentation and both presentations are again used for ideational learning. A last chapter deals with a comparative study of all of the experiments. Indeed, the student is expected to work out correlations for each experiment with each of the previous ones.

The book has real value in presenting in a systematic form the materials for a first-hand study of different kinds of learning and the relations between them. The author also gives a number of experimental devices which are interesting and of great value. It seems unfortunate that the author did not then continue and give experiments on economical methods of learning which would have made the book of much greater value. The reviewer believes that the descriptions of the experiments and of the sample results and their interpretations are too detailed to be placed in the hands of the student. He does not have to use his own imagination enough, and hence does not get the maximum amount of training which the study of the experiments in such a manual should give.

SAMUEL W. FERNBERGER

UNIVERSITY OF PENNSYLVANIA

SCOTT, W. D., and CLOTHIER, R. C. *Personnel Management, Principles, Practices and Point of View*. Chicago: Shaw, 1923. Pp. xxii+643.

This volume, by a former president of the American Psychological Association and the one-time employment manager of the Curtis Publishing Company (respectively President and Vice-President of The Scott Company), will be expectantly examined by psychological readers. The conspicuous part played by both authors in the personnel work of the army and the general desire to know something more definite about the results of the Carnegie Institute enterprise also add to the interest with which the volume will be received. At last we have a volume on "personnel work" that does not specialize in the details of office management on the one hand nor the technique of records and bonus systems on the other.

In the present book these aspects are not neglected, but the emphasis is throughout on "personal relations." It takes its stand on the fundamental facts of individual differences in capacity, interest, and opportunity. The worker-in-his-work is emphasized as the unit involved in management problems. In the various features of



human engineering that arise, due consideration is constantly given on the one hand to common-sense facts about human nature, and on the other to the more technical contributions and instruments which psychologists have recently assisted in developing.

The tone of the book is throughout extremely moderate and even tentative, always suggestive rather than dogmatic. Even the experimental data, of which many samples are given, are used chiefly as illustrations, almost never as conclusive proof of any contention.

This tone of reasonableness is effectively maintained, and the reader is given a fair picture of the contemporary status, the diversified range, the problematic nature, and the high importance of personnel research and the principles of human management.

The first seven chapters consider the general aspects of personnel procedure, the causes of waste and unhappiness, types of organization, sources of labor supply, various problems of selection, placement, supervision, training, classification, incentive, reward, and the like. Through this introductory discussion is shown the need for adequate instruments and technique, later to be presented.

The next eleven chapters consider more specifically the construction, development, and use of an array of more or less technical instruments and procedure—the occupational description, promotion chart, application blank, qualification card, rating scales, tests of mental alertness, special ability tests, measures of trade knowledge, control charts, and the like. This section is amply illustrated by concrete examples and actual data and experience records. Samples of the various forms and instruments are also given.

The remaining nine chapters consider especially the various contact problems involved in the supervision, promotion, and training of employees—personal adjustments, wage determination, foremanship, follow-up work, problems of labor turnover, and the constant importance of personnel research.

An Appendix, occupying the final quarter of the book, gives a series of typical reports and surveys, digests of papers on labor-turnover computation, a plan of apprentice training, and a detailed account of experiments in the development of the graphic rating scale. An adequate index is provided, and a seven-page bibliography. In addition, each chapter is provided with an array of well-selected references.

For psychological readers the text will seem dilute, repetitious and unduly simplified. The broad generality of statement may be mistaken for vagueness and uncertainty. Thus the reader is too

often informed that mental alertness tests are designed to measure mental alertness. Other acceptable truths are also too often repeated and paraphrased. The gradual unfolding of the need, the nature, the value, and finally the use of the various devices involves repetitious postponement on the one hand and reminiscence on the other.

But on the whole the book is not written for professional psychologists, however profitably they may read it. The generality of statement is inherent in the nature of the topic, when this is presented in general outline rather than for the special requirements of a given establishment. The presentation is pedagogically planned for the elementary reader, who lacks background and cannot take too many ideas at a time.

The inclusive scope of the book and the absence of rules of thumb make it a useful antidote for the familiar student who knows some tests and hence feels qualified for personnel management. Numerous fields are indicated in which scientifically minded workers may make continued useful contribution. Especially wholesome and farseeing is the emphasis of the research aspect of the personnel office, with its implication that personnel management is a living activity rather than a cut and dried technology.

H. L. HOLLINGWORTH

COLUMBIA UNIVERSITY

FOSTER, WILLIAM S. *Experiments in Psychology*. New York: Holt, 1923. Pp. x+309.

The author presents a series of laboratory experiments which follows the sequence of topics found in Woodworth's *Psychology*. The experiments are so arranged that it is possible to have a relatively large class, divided into groups, working on the same experiment simultaneously.

The first part of the book deals with general considerations of experimentation, particularly with psychological observation and report, and general hints for the students for conducting an experiment. The importance of not suggesting possible results to one's partner is emphasized. Then follows a chapter on graphic representation in which the plotting and interpretation of curves, polygons, histograms, and bar-diagrams are considered. In the next chapter, devoted to representative values, the mean, median, mode, and quartiles are discussed as well as their measures of variability. In this connection the mean variation, probable error, and standard

deviation are considered. In the next chapter, entitled reliability and comparison, such questions as the reliability of a discovered difference between averages are treated both from the statistical and the interpretative points of view. These chapters, in connection with an experiment on correlation, are, in the opinion of the reviewer, the best elementary presentation for the introduction to statistical treatment of results to be found in the psychological literature. It is true that the elementary student has to take the formulae on faith, but this does not seem to be a disadvantage, as the elementary student has to do that anyway. And this simple and clear presentation has the advantage of not discouraging the student with a mass of mathematics which either has to be disregarded entirely by the instructor or are at best only incompletely understood. The present text also has the added advantage of emphasizing the interpretation of the final statistical values.

The first experiment, on the Müller-Lyer illusion, is appropriately chosen inasmuch as it emphasizes the difference between the physical and psychological points of view in the mind of the student. The experiment is performed with an illusion board so that a quantitative measure of the effect of the illusion may be obtained. Another experiment on Weber's Law for lifted weight stimuli is performed with the method of barely noticeable differences and of subliminal differences. An experiment on the knee jerk and one on reflex organic responses, such as breathing, automatograph and pulse, acquaint the student not only with the facts but also with graphic methods of registration. Reaction time—simple, sensorial, and muscular—are indicated in the next experiment. Then follows directions for studying set and complex behavior in which pied type, skeleton words, and anagrams are used as material. Habit formation in a maze and mirror drawing follow. This group of experiments acquaint the student in a first-hand manner with different levels of response and, in the opinion of the reviewer, are very appropriately chosen to show all of the intermediate reaction types from the simple reflex to the very complex breaking down of lifelong habits.

The next four experiments have to do with sensation, and Foster has chosen cutaneous sensations, taste and smell, color mixing and visual afterimages as his problems. Again these seem to be very well chosen, inasmuch as the student begins with the simple cutaneous sensation and ends with the much more complex visual sensation. Also the last of these, that on the visual afterimage, is an excellent transition experiment between the work on sensation proper and the

following problem of imaginal types. This latter is studied by recalling material which is planned to appeal to a certain sense modality and also by a questionnaire.

Next comes the chapter on correlation already referred to, and then follows an intelligence test in which the Army Alpha is used. This is followed by a presentation of the attention value of advertisements in which is considered the value for catching attention and for holding interest. The following experiment has to do with the affective value of musical intervals, which is tested by the method of paired comparisons. This acquaints the student not only with this method but also gives him some knowledge of auditory sensation which, it will be remembered, was not included in the experiments on sensation proper.

Two experiments are concerned with methods for investigating memory. Various sorts of material are used and different kinds of presentation. The methods of complete mastery, prompting, right associates, and retained members are used. The experiments are also so arranged as to consider such problems as the part and whole method in learning and distributed *versus* concentrated learning. Next follows an experiment on "free" association of ideas, and this is followed by the study of the diagnostic value of associative responses. Then come two experiments on the perception of solidity and distance and on the perception of time. In the first the author presents materials for the study of double images, monocular *versus* binocular estimation of distance and stereoscopy. The last two experiments have to do with the judgment of intelligence from photographs and the judgment of emotions from photographs.

Each experiment starts with a short statement of the problem and has at the end a series of questions which the experiment is expected to bring out and also a short list of references for more intensive reading. In an appendix Foster outlines the materials which are used in each experiment and indicates where those which cannot easily be made in the laboratory may be purchased.

The reviewer believes that this manual is the best that has yet been published for the elementary student. From a completion of the experiments indicated, the student will not only have obtained a first-hand knowledge of a surprisingly large number of facts but, what seems more important, will have had training in a surprisingly large number of the most important psychological methods now in

use. And it would seem that such a varied and extensive training in method should be the real function of any elementary course in experimental psychology.

SAMUEL W. FERNBERGER

UNIVERSITY OF PENNSYLVANIA

WARREN, HOWARD C. *Précis de Psychologie*. (Trans. by L. Cunault and E. Maigre.) Paris: Rivière, 1923. Pp. 445.

Translation of the second edition of the *Human Psychology*. The translation is an excellent one and the book may be useful to American students in gaining a reading knowledge of psychological French by comparing the original with this translation.

S. W. F.

SNOW, A. J. *Problems of Psychology*. New York: Holt, 1923. Pp. vi+115.

The book is a compilation of nearly 1,000 questions and problems which can be used in the study of psychology. The questions are chosen so that they will be useful for any of the several existing points of view in psychology. Hence they can be used in connection with any standard text. The problems consist largely of short propositions—frequently quoted from some standard text—which the student is asked to explain. The problems are collected under the following headings, which do not need, however, to be used in consecutive order: 1. Definitions and Methods; 2. Nervous System and its Relation to Behavior; 3. Reactions of Different Levels; 4. Attention; 5. Sensation; 6. Perception; 7. Native and Acquired Traits; 8. Emotion and Sentiment; 9. Feelings; 10. Associations; 11. Memory; 12. Imagination; 13. Reasoning; 14. Intelligence, Learning, Work and Fatigue; 15. Will and Action; 16. The Self; 17. Problems for General Review. This book should be of great help to those who are running quiz sections in a course of general psychology and it would also be of great assistance in the framing of examination questions.

SAMUEL W. FERNBERGER

UNIVERSITY OF PENNSYLVANIA



BYKOWSKI, L. J. *Badania eksperymentalne nad znaczeniem współzawodnictwa. (Experimental investigation of the rôle of emulation.)* Warsaw, 1923.

This monograph gives the results of experiments on 744 individuals, mostly boys and girls. The tests were dynamometric, adding digits for 100 seconds, observations of differences in pictures, ability to make sentences and original aphorisms. In most instances emulation was found to add considerably to the abilities tested. In different racial types the emulation effects differed. In the northern blond dolicocephalic there was less increase than in the Eastern blond brachycephalic. The better pupils made greater gains than the duller, as did also those beyond the age of puberty as compared with those who had not reached puberty. Coeducation was found unfavorable. The general results from Polish children are contrasted with those from German children, who do not perform well in competition. The author adds a theoretical explanation for this latter. The reviewer is able to give the above brief summary because of the French résumé which is appended to the monograph.

S. I. FRANZ

FREUD, S. *Cinq leçons sur la psychanalyse.* (Translated by Y. LeLay. Introduction by E. Claparède.) Paris: Payot, 1924. Pp. 126. 5 fr.

The five lectures by Freud are well known and need no review comment. The long introduction by Claparède points out that psychoanalysis may be considered (1) a method of examination, (2) a method of treatment, (3) an attempt to apply to mental life the principle of determinism, and (4) a general hypothesis of the unconscious. He also points out as the main principles of Freudian psychoanalysis the following: (1) repression; (2) action of repressed elements; (3) disguise or replacements; (4) the dream; (5) compensation for reality; (6) symbolic thinking; (7) refuge in illness; (8) the libido. In an "additional note" Claparède discusses Freud's conception of the libido, which the latter considered incorrectly outlined in the introduction. Claparède publishes a letter from Freud, in which the latter denies that the term libido is used by him for anything more than the *Sexualtrieb*, which he considers to be separate from the *Ichtrieb*.

SHEPHERD IVORY FRANZ

DUNLAP, KNIGHT. *Personal Beauty and Racial Betterment*. St. Louis: Mosby, 1920. Pp. 95.

This interesting essay first examines the significance of beauty and then considers its conservation. In the first part, the author shows that personal beauty depends upon negative as well as positive conditions. Beauty is not recognized in hated or despised racial types, nor do we find beauty in the diseased, the deformed, or in any marked variation from the physical norms. On the other hand, beauty is determined by such positive characters as stature, bodily proportions, features, hair, muscular tonicity, and poise. Although the sexes differ somewhat in the positive characters desired, Dunlap declares that beauty is essentially the expression of the germinal potentiality of the individual. Beauty therefore becomes an attribute of vital importance to the human race since it implies optimal reproductibility.

In considering the conservation of beauty, the author points out that civilization has obstructed the elimination of the unfit—and therefore unbeautiful—by the development of humanitarianism, which provides the less virile with a greater chance of survival. Moreover, the desire for children is frequently replaced by other desires, usually economic, in the choice of a mate. Prostitution, even though it has hindered the propagation of weak and undesirable types, presents an important obstacle to racial betterment. The most obvious constructive step toward the conservation of beauty is the sterilization of the hopelessly insane, feeble-minded, and criminal. The author, however, discards this measure as a present possibility since it would place too powerful a weapon in the hands of the medical profession.

At the present time, the solution to the problem is to be found in more widespread publicity regarding venereal disease, general facts of heredity, and birth control. Popular misconceptions regarding inbreeding should be corrected. Inbreeding accentuates the desirable as well as the undesirable traits in consanguineous stock, and even the accentuation of weakness is of value, since it discloses those strains which should be eliminated. The program for racial betterment also requires that marriage shall be based upon the attraction of beauty alone, and that such unions shall be more fruitful than those of the less fit. The present overpopulation, increasing despite wars and pestilence, can be reduced by the dissemination of knowledge concerning birth control. At the same time the upper classes should be encouraged to have more children. The growing economic

freedom of women indicates that childbearing will eventually be recognized as a contribution to the state, and racial betterment will probably be furthered when motherhood receives adequate compensation from the state.

Although it is hardly susceptible of proof, the author presents his thesis in an interesting and convincing manner, and the little volume must be regarded as a real contribution in the fields of aesthetics and eugenics.

KARL G. MILLER

UNIVERSITY OF PENNSYLVANIA

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## NOTES AND NEWS

G. STANLEY HALL, president emeritus of Clark University, died on April 24th at the age of seventy-eight years. By Dr. Hall's will the bulk of his estate is left to the university for the creation of "the G. Stanley Hall Foundation, the principal to be held intact forever, and the income used exclusively for research in genetic psychology". Subsequently President Hall's son, Dr. Robert Hall, has given to Clark University his father's library and certain furniture from which the university will reconstruct a replica of Dr. Hall's seminar room.

THE Helmholtz gold medal, awarded once in ten years by an international committee for the most significant research in the domain of optics, has been given to Professor K. von Hess, of Munich, for his investigations on color vision.

DR. EDWIN G. BORING of Harvard University and Dr. Knight Dunlap of Johns Hopkins will teach at the Summer Session of the University of California.

THE annual meeting of the Western Psychological Association will take place at Stanford University, California, Friday and Saturday, August 8-9, 1924. Psychologists are cordially invited to attend. Further information may be obtained from Professor W. R. Miles, Box 568, Stanford University, California.

PROFESSOR CHRISTIAN A. RUCKMICK, associate professor of psychology in Wellesley College, has been elected professor of psychology in the State University of Iowa.

ON April 30th, Professor Raymond Dodge of Wesleyan University was elected to membership in the National Academy of Sciences.

PROFESSOR ROSWELL P. ANGIER, director of the Psychological Laboratory of Yale University, has been appointed professorial lecturer in psychology at the University of Chicago.

AT Yale University, Dr. J. Crosby Chapman has been promoted to a full professorship of educational psychology.

PROFESSOR E. A. MCC. GAMBLE of Wellesley College is on leave of absence for the second semester, making a tour of European laboratories of psychology and psychiatric clinics.

PROFESSOR EDGAR JAMES SWIFT, head of the department of psychology in Washington University, has been appointed a member of the consultant staff of the St. Louis Psychiatric Clinic.



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